The New Energy Economy

George A. Erickcek
W.E. Upjohn Institute for Employment Research
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Agenda

- What is the global long-term outlook?
- Energy as a factor of production and market driver for businesses
- Energy as a potential economic driver for the state of Michigan
- Final thoughts on the spatial impact of higher energy costs

Long-term Outlook

- Fossil fuels will remain the primary energy source (more than 75% of new energy production 2007 -2030)
  - Most of the growth will occur in developing countries.
  - Oil use to increase by 1% per year with transportation accounting for 97% of the demand.
  - OPEC countries will dominate in production.

Source: OECD International Energy Agency

Long-term Outlook (cont'd)

- Fossil fuels will remain the primary energy source.
  - Electricity demand will grow by 2.5% per year powered by coal and gas.
  - 80% of the demand will be in developing countries—28% China.
- Non-hydro renewable energy will be the fastest growing from 2.5% to 8.6% of the market—*still a small share.*

Source: OECD International Energy Agency

Long-term Outlook (cont'd)

- An Uncertain Forecast
  - Total oil reserves are still unknown and vary with price.
  - Current financial conditions have slowed the construction of energy capacity.
  - Rapid increase in greenhouse gases and possible natural feedback loops—*the melting of the permafrost.*
  - Price of oil will likely increase at an erratic rate.

Source: OECD International Energy Agency

Thoughts on Economic Development

The very essence of long-run growth is, in fact, *the transition* ...from one export base to another as the area matures in what it can do, and as rising per capita income and technological progress change *what the **world** economy wants done*.

W.R. Thompson (1965)

For the standard business what will this mean?

- Uncertain increases in transportation costs.
  - If cost increases as expected, North American manufacturer will become more competitive.
  - New markets that are now dominated by foreign producers will be vulnerable to local suppliers.
  - Producing where you sell will become more reasonable.

For the standard business what will this mean? (cont'd)

- Uncertainty in electric costs and energy regulations
  - Energy conservation efforts will only increase
    - New and rehab construction
    - New lighting solutions
    - Better-designed, energy-efficient production

For the standard business what will this mean? (cont'd)

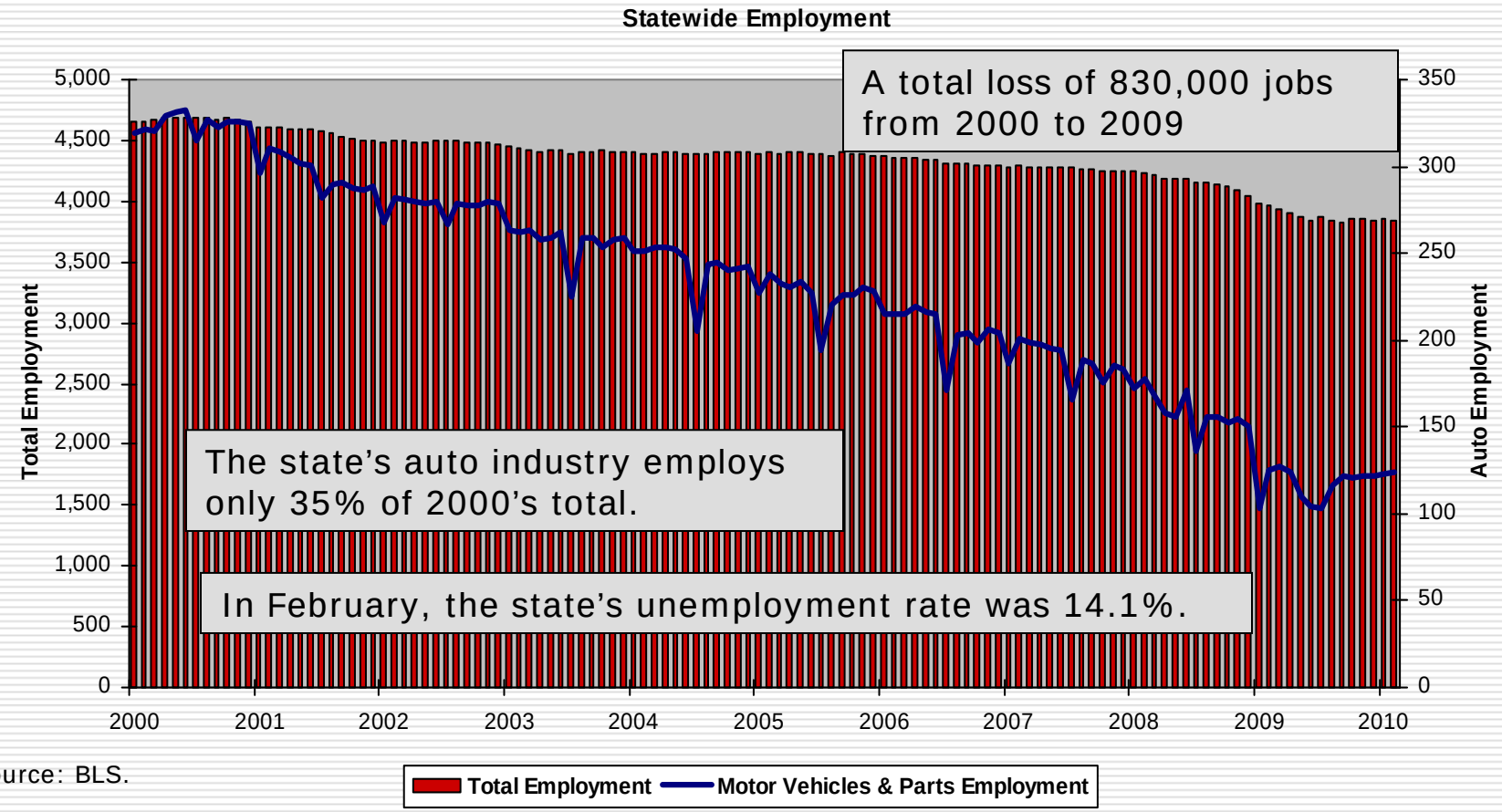
- New products and services
  - Well designed and energy efficient
  - New lifestyles
  - New residential construction
  - Rehab construction
- Government incentive programs to combat greenhouse gases.

Global Challenges

- Financial crisis and uncertainty are limiting capital financing.
- Developing countries will account for nearly all projected growth in energy-related CO_2 production.
- End-use efficiency offers the greatest potential for cutting CO_2 emissions.

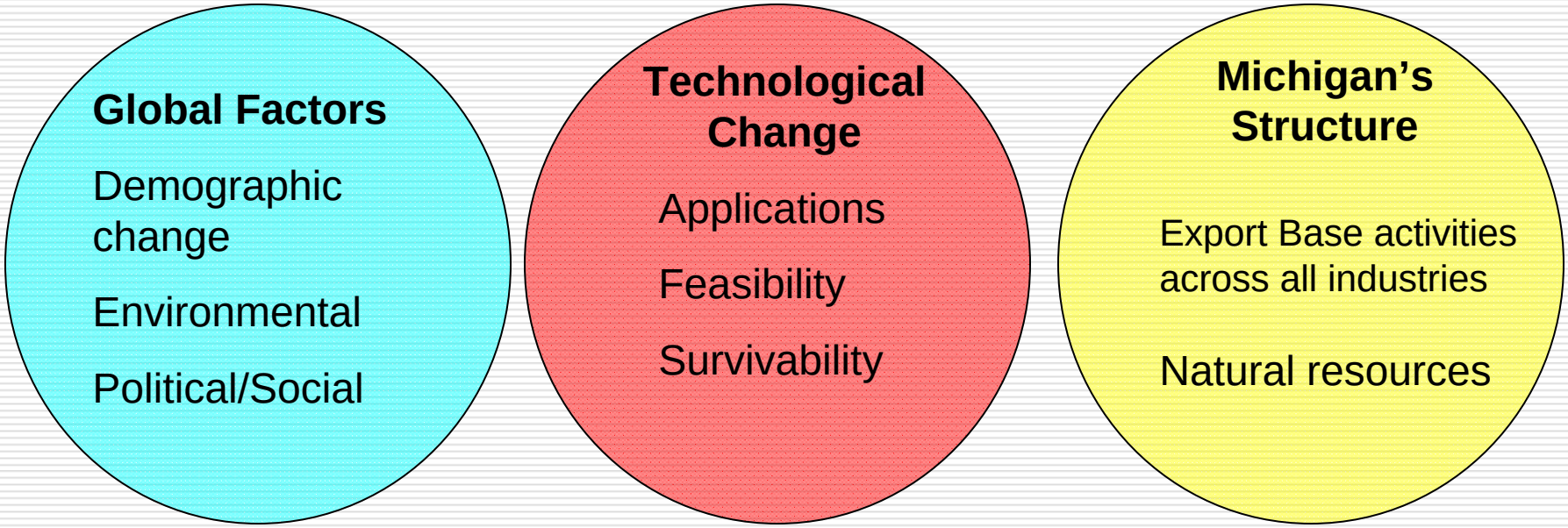
What is potential for green energy to become an economic driver for Michigan?

The state's employment situation is structural not cyclical.

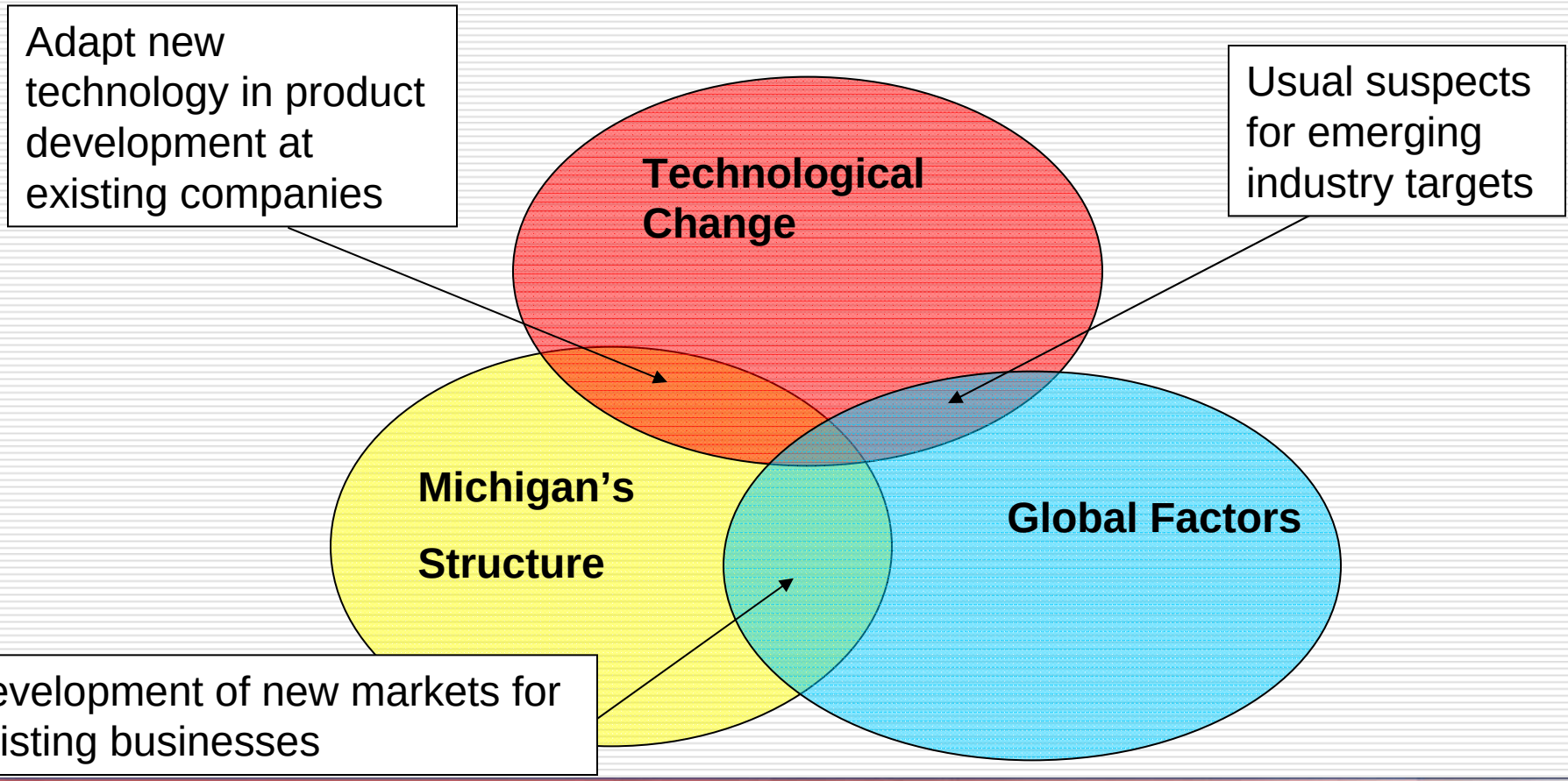


Source: BLS.

Success depends on identifying interaction of three key elements of regional economies:



Emerging Industry Opportunities



What is potential for green energy to become an economic driver for Michigan?

- Structure, Technology, Global Factors
  - Battery production
    - Toda America Inc., Battle Creek (Japan)
    - Johnson-Control-Saft, Holland
    - LG Chem Ltd., Holland (South Korea)
    - Fortu PowerCell GmbH, Muskegon (Germany)
  - Wind Turbines and Power Generation
  - Solar Power Equipment

State Challenges

- The Development of Green Career Pathways.
  - Construction especially rehab
  - Manufacturing alternative energy equipment

Green Career Pathways

- STEM – Teaching the Teacher in ESL
- Job Readiness Programs
- Pre-Apprentice Program (2+2)program between HS and CC.
- Apprenticeship
- Community College – Bus & Ed partnerships

Source: Apollo Alliance, CSW, *Mapping Green Career Pathways: Job Training Infrastructure and Opportunities in Michigan* Jan 2010

State Challenges

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- Michigan's fiscal structural deficit may not allow:
  - The funding on new green education initiatives
  - Tax incentives and infrastructure improvements for its emerging "green" technologies

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- Entrepreneurial environment

Stages in a Firm's Product's Life Cycle

Innovative ideas can happen and do happen in almost any industry.

- According to the Europeans, Innovation happens when:
  - Strong inter-industry networks and "third places" are created.
    - Marshall (1890) innovation happens when there are "ideas in the air."
  - Design matters.

Ongoing Research Effort on the Importance of Design

- What we found so far:
  - Design is risky, but inaction can be fatal.
  - Design can beat out engineering.
  - Design is expensive; being an industry leader invaluable.
  - Design is customer-focused, while it is too easy to become provider-focused.
  - It is easier to lose Design than to regain it.

Final Thoughts on the Spatial Impact of Higher Energy Costs

- If most of the growth occurs in the developing countries and transportation cost soar: *direct investment and not exports will lead the way.*
- If transportation costs do increase, it could open up more niche markets domestically for entrepreneurs across all fields.
- In addition, there will be political and social pressures to buy and produce locally.
- Urbanization and not suburbanization will become more and more attractive.

Finally,

If someone unlocks fusion energy ignore everything I have said.

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Or e-mail me: ***erickcek@upjohn.org***